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COPPER WALL RESEARCH AT MONROE IN 2020

by Ross Dunseath, PhD

Ross is an electrical engineer who has been involved in consciousness and physiological monitoring research since his undergrad days at the Experiential Learning Lab at Duke University. He continued his education at Duke in both engineering and psi research, earning a PhD in electrical engineering in 1992. During that time, he was involved in the design and construction of instrumentation for neurofeedback, heart monitoring, and the detection of physiological correlates of psi phenomena.

He next worked with researchers at the University of North Carolina, designing and constructing high-density EEG data acquisition systems, with applications in simultaneous fMRI and EEG imaging. In 2010 he joined the staff at the Division of Perceptual Studies at the University of Virginia where he is the co-director of the Westphal Neuroimaging Lab and is engaged in physiological studies of psi phenomena.

TMI presents a great opportunity for research in consciousness and human potentials, and Ross is busy upgrading the technical foundation in the labs for launching all kinds of studies.

It's been an interesting year at the copper wall room (CWR) inside the Millenium Room on the mountaintop at Roberts Mountain Retreat, to say the least.

After finishing construction of the CWR in early 2019, installation of a computer, electrometer (thanks to a generous grant) and video recording capability enabled a first step in attempted replication of Elmer Green's pioneering research into large electric fields apparently generated by meditators and healers.

Follow the progress of the Copper Wall project here:

- August 29, 2019: The TMI Copper Wall • Exploratory Research
- May 19, 2019: TMI Copper Wall Research Update
- November 6, 2018: The Copper Wall Project

Much was learned about the delicate nature of body electric field measurements, especially regarding unwanted sources of interference generated by "triboelectric" charge, which can appear when two insulating materials are in contact and then separated. Obtaining clean measurements is a challenge for many types of physiological recordings, and interference from movement (aka "artifact") is often an offender. To get good quality CWR recordings, we found that avoiding movement artifact and triboelectric charge required participants to stand very still, which can be difficult to maintain for long. We tried using a nice wicker (non-metallic) chair but discovered it apparently shunted enough charge away from the body to reduce the voltage readings, and the cushion was another triboelectric charge offender. Perhaps a bar stool (sans cushion) could work, and that will be tested before moving into the next round of CWR experiments coming up. We want our CWR volunteers to be reasonably comfortable!

Green's group observed two aspects of the electrical measurement, a DC (slow-moving) baseline voltage, and occasional low-frequency single pulses. Using the same model electrometer as Green, connected to ankle, wrist or earlobe, we observed a range of DC voltages, from -6v to +70v, with most of the readings in the 0-2v range. This was done on approximately 35 volunteers, and about half of the readings were exploratory, dealing with the artifact and comfort challenge. We were also looking for pulses and observed several that appeared under acceptable conditions (i.e., no movement) but none of them had the large amplitudes reported by Green. This could be due to a limitation in the recording instrumentation, a high-pass filter issue. However, the appearance of pulses has provided the motivation for upgrading CWR instrumentation and that is now underway.

DC voltages turned out to be more interesting than expected. *When a couple of healers demonstrated DC voltages of 50 and 70 volts on demand, combined with physical healing effects and random number generators (RNGs) going off-random, we started paying more attention to this most basic measurement.* Further measurements showed some volunteers apparently were changing DC levels by intention, and even though they weren't running up voltages to stratospheric levels they were doubling or tripling initial readings. What does this mean? What physiology could be responsible for

generating high-level electric fields around the body? Certainly, none accepted by present medical science!

Because of this controversy, every effort must be made to rule out alternative mundane explanations, and that has been the focus in CWR engineering for the last quarter of 2019. Control of movement and triboelectric artifact has been discussed above, but there could be other sources of electrostatic interference from the environment such as atmospheric electricity. Fortunately, the CWR is underground and the copper walls are backed by parallel panels of grounded aluminum acting as a shield. Nonetheless, the possibility of charge from passing clouds affecting the measurement must be addressed (yes, it's that sensitive, as we discovered when lightning strikes miles away induced small fast pulses in the recording).

Slowly varying DC baselines would be the most affected by passing clouds, so step one is to run continual monitoring of electric field levels in the CWR to see if they vary with weather conditions. Fortunately, observations already made argue against atmospheric electricity (different people showing different readings on the same day for example) but confirmation is required. If it turns out to be an issue, there are methods to control for it such as monitoring the electric field above the CWR and outdoors next to the lab. (It's just another challenge in the world of instrumentation). Rugs can be another source of electrostatic interference, and it may be necessary to remove a bit of the rug next to the CWR where the instrumentation desk is located.

Other environmental variables have been noted such as relative humidity, which can be a challenge in the summer as high humidity can cause charge leakage. This is why a dehumidifier is now located on the same floor as the CWR. In the winter the opposite can be true—too dry—but then again, dry conditions are optimal for minimal charge leakage from the body. However, very low humidity is also conducive to triboelectric problems such as static charge from shuffling across a rug. Thus, we always have participants initially touch the ground to get rid of static electricity. These are just a few of the variables that must be addressed in making this type of research acceptable for consideration by the mainstream-science world.

Now for the best part, the lineup of sensors in the works for CWR research in 2020.

The first measure, of course, is electric field activity on or near the body, acquired by an electrometer. We have one of these, the model (a very good one) used by Elmer Green's group, and we plan to add another electrometer of more recent design that could be the basis for multichannel mapping of the body electric field. In addition, I have two other experimental devices for measuring electrical effects on the body, capacitively-coupled voltage sensors and direct or capacitively coupled charge sensors.

These devices are all easy to use and present minimal nuisance (wrist strap, ear clip, headband, no goopy electrodes). A 2-axis motion detector attached to the headband will help control for motion artifact by indicating where in the recording the signals are invalid due to movement. Video monitoring using the Biofield Viewer software may help identify body energy effects in synchrony with voltage measurements and will also help control for physical movement.

RNGs are always running in the CWR background and we want to include more of these in Monroe research in general. Other types of sensors such as magnetometers and cosmic ray detectors could join the mix*. There may be surprises in the works as well, some new kinds of field detectors from the exotic world of extended electromagnetics*, but that's a topic for a future blog post.

The plan, for now, is to get the gear in place, settle on a protocol for a formal study and get moving (actually, please don't move in the CWR). Research specialist Nancy McLaughlin-Walter will be announcing signups for the study as soon as we have the University of Virginia institutional review board (IRB) approval, and we both will be running volunteers in the fabulous Copper Wall study in 2020. See you there!

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